

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

Applicant's or agent's file reference TS 1253 PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 03/50786	International filing date (day/month/year) 03.11.2003	Priority date (day/month/year) 04.11.2002
International Patent Classification (IPC) or both national classification and IPC B01J35/02, B01J32/00, C10G47/12, C07C1/04		
Applicant SHELL INTERNATIONALE RESEARCH MAATS... et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 28.05.2004	Date of completion of this report 14.02.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer de Cauwer, R Telephone No. +49 89 2399-7344 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/EP 03/50786**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-22 as originally filed

Claims, Numbers

1-14 received on 03.12.2004 with letter of 03.12.2004

Drawings, Sheets

1-2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/EP 03/50786**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-14
Inventive step (IS)	Yes: Claims	
	No: Claims	1-14
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP 03/50786

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: US-A-4 517 077 (CLEMENTS PORTER)

D2: WO 03 013725 A (MESTERS C.;VAN HASSELT B.)

D3: US-A-3 764 565 (JACOBS R ET AL)

D4: US-A-4 645 754 (SAOTOME MINORU ET AL)

D5: DE 33 15 105-A (LEUNA-WERKE VEB)

2. The examiner charged with the International Preliminary Examination concurs with the opinion established in the international search report that the documents **D1 and D3-D5 are of particular relevance.**

The amendments made to claim 1 by introducing the subject-matter of former claim 2 leads to unclarity (Article 6 PCT). There is no definition (above) of "existing endstanding protrusion" and this term is unclear in itself. Further, the expression "the existing endstanding protrusion becoming the new central circle, protrusion" is unclear (Article 6 PCT), it does not seem to refer to a particular feature.

- 2.1 Thus, **D1** is considered to **anticipate** under Article 33(1) and (2) PCT the subject-matter of the claims referred to in the international search report.

The Applicant's attention is in particular drawn to the **passages cited in the said report.**

- 2.2 In addition, the documents **D3-D5** (see the passages indicated in the search report) disclose catalyst (supports) having very similar designs as those presently claimed.

In the absence of comparative tests showing that certain advantages or unexpected effects exist over these prior art catalysts an inventive step cannot be recognized thereto (Article 33(3) PCT). A trilobe cannot be considered as comparative example since it does not represent the closest state of the art (see e.g. D1). Furthermore, it is unclear what shape the catalysts of example 2 have since they only vaguely refer to claim 2, which is now incorporated in claim 1. This represents a lack of disclosure.

3. Although the document **D2** does not constitute prior art for the purposes of Article 33(2)

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP 03/50786

and (3) PCT, its content is of particular relevance (see in particular Figure 1) and may be opposed (because of the expression "**comprising two protrusions**") under novelty to the subject-matter claimed in the present international application in its regional (or national) phases.

- 23 -

TS 1253C L A I M S

1. Elongated shaped particle comprising two protrusions each extending from and attached to a central position, wherein the central position is aligned along the longitudinal axis of the particle, the cross-section of the particle occupying the space encompassed by the outer edges of six circles around a central circle, each of the six circles touching two neighbouring circles whilst two alternating circles are equidistant to the central circle and may be attached to the central circle and the two circles adjacent to the two alternating circles (but not the common circle) touching the central circle, minus the space occupied by the four remaining outer circles and including four remaining interstitial regions, ~~the~~

^(Further)
15. ~~the~~ elongated shaped particle comprising one to four additional protrusions, preferably one or two additional protrusions, each attached to an existing endstanding protrusion as defined ^{above} ~~in claim 1~~, the additional protrusion being defined in the same way as ^{above} ~~in claim 1~~, the existing endstanding protrusion becoming the new central circle, the original central circle becoming the other protrusion.

2. Elongated shaped particle according to claim 1 ~~or 2~~, having a cross-section in which the two remaining alternating circles and, if present, the additional protrusions have diameters in the range between 0.74 and 1.3 times the diameter of the central circle as defined in claim 1, preferably between 0.87 and 1.15 times the diameter of the central circle as defined in claim 1.

- 24 -

3. Elongated shaped particle according to claim ~~1~~ ^{or 2},
in which the angle between the two lines connecting the
centers of the two remaining circles and the central
circle is between 90° and 180° or between 270° and 180°;
preferably between 110° and 150° or between 210° and
250°, more preferably 120° or 240°.

4. Elongated shaped particle according to claims 1 to 3,
having a cross-section in which the two remaining
alternating circles and, if present, the additional
protrusions have the same diameter as the central circle
as defined in claim 1, preferably elongated shaped
particle, in which the two alternating circles and, if
present, the additional protrusions are attached to the
central circle as defined in claim 1, or, if applicable,
claim 2.

5. Elongated shaped particle according to claims 1 to 4,
having a L/D ratio (mm/mm), wherein D is the diameter of
the central circle as defined in claim 1, of between 1
and 25, preferably between 2 and 10, or elongated shaped
particle according to claims 1 to 5 having a length in
the range between 0.5 and 15 mm, preferably between 1
and 5 mm.

6. Shaped catalyst or catalyst precursor containing a
catalytically active component or a precursor therefore,
supported on a carrier, which carrier is an elongated
shaped particle according to claims 1 to 5.

7. Shaped catalyst or catalyst precursor according to
claim 6, wherein the component is selected from elements
of Group VIII of the Periodic Table of the Elements,
preferably shaped catalyst or catalyst precursor wherein
the Group VIII element is Fe, Co or Ni, preferably Co.

8. Shaped catalyst or catalyst precursor according to
claim 7, wherein the carrier is a refractory oxide,

- 25 -

preferably silica, alumina or titania, more preferably titania.

5 9. Shaped catalyst or catalyst precursor according to claim 7 or 8, containing an element or compound selected from Group IIA, IIIB, IVB, VB, VIB, VIIB or VIII of the Periodic Table of the Elements, preferably selected from V, Zr, Mn, Ru, Re, Pt, Pd or Ag.

10 10. Shaped carrier according to claims 1 to 5 or a catalyst or catalyst precursor according to claims 6 to 9, wherein the carrier or catalyst has been made by extrusion.

15 11. Process for the preparation of a carrier according to claims 1 to 5 or a catalyst or catalyst precursor according to claims 6 to 9, by pressing, extruding or otherwise forcing a granular or powdered catalyst or catalyst precursor material into various shapes under certain conditions, which will ensure that the particle retains the resulting shape, both during reaction as well as regeneration, preferably by extrusion.

20 12. Die-plate designed for use in the preparation of a carrier or a catalyst or catalyst precursor according to claim 10, wherein the die-plate comprises one or more orifices in the shape of the cross-section of the carrier particles as defined in any of the preceding claims.

25 13. Process for the preparation of hydrocarbons by contacting a mixture of carbon monoxide and hydrogen with a catalyst as described in claims 6 to 10, the catalyst being optionally activated.

30 14. Process for the preparation of fuels and base oils from the hydrocarbons described in claim 13, by hydrogenation, hydroisomerisation and/or hydrocracking.

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